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an interdisciplinary journal

HISTOIRE DE L'HORTICULTURE AU CANADA

revue interdisciplinaire

Vol. 1, No. 4, 1988

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HISTORICAL HORTICULTURAL STUDIES
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ROYAL BOTANICAL GARDENS

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CANADIAN HORTICULTURAL HISTORY

an interdisciplinary journal

The Centre for Canadian Historical Horticultural Studies (CCHHS) was established at the Royal Botanical Gardens, Hamilton, Ontario, in 1979 through an endowment from the Dunington Grubb Foundation. The functions of CCHHS are to collect documentation on all aspects of the history of Canadian horticulture and to facilitate publication of original research in its journal Canadian Horticultural History .

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revue interdisciplinaire

Le Centre for Canadian Historical Horticultural Studies (CCHHS) a été créé au Royal Botanical Gardens de Hamilton (Ontario) en 1979 grâce à une donation de la fondation Dunington Grubb. Le CCHHS a pour mission de recuellir des documents sur tout ce qui concerne l'horticulture canadienne et de permettre la publication d'études originales dans sa revue intitulée Histoire de l'horticulture au Canada

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CANADIAN HORTICULTURAL HISTORY

HISTOIRE DE L'HORTICULTURE AU CANADA

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IAC. CORNVTI
DOCTORIS MEDICI
PARISIENSIS

CANADENSIVM PLANTARVM,
aliarúmque nondum editarum

HISTORIA.

Cui adiectum eſt ad calcem

ENCHIRIDION
BOTANICVM PARISIENSE,

Continens Indicem Plantarum, quæ in Pagis, Siluis, Pratis, & Montoſis iuxta Pariſios locis naſcuntur.

PARISIIS,
Venundantur apud SIMONEM LE MOYNE, viâ Iacobeâ.

M. DC. XXXV.
CVM PRIVILEGIO REGIS.

Fig. 1. Title page of Cornut's *Canadensium Plantarum Historia* (from the facsimile edition).

Canadian Horticultural History/Histoire de l'horticulture au Canada 1(4): 190-209, 1988

HOW "CANADIAN" IS CORNUT'S *CANADENSIUM PLANTARUM HISTORIA?* A PHYTOGEOGRAPHIC AND HISTORICAL ANALYSIS[1]

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Abstract

Of 38 identifiable North American plant species described by J.-P. Cornut in his *Canadensium Plantarum Historia* (1635), 7 are not native to Canada and must have been introduced from localities in the present United States, and the horticultural history of 13 other species indicates that they too were introduced to French gardens from localities south of the present border. Six species with poorly known horticultural histories could have come from either present country. Twelve species appear to have been introduced to French horticulture directly from present-day Canada. Of these, 11 could have been obtained in the vicinity of Québec City, but at least one appears, from its range, most likely to have been collected near Georgian Bay.

Résumé

Parmi les trente-huit (38) espèces végétales nord-américaines identifiables d'après les descriptions de J.-P. Cornut dans son ouvrage *Canadensium Plantarum Historia* (1635), sept (7) ne sont pas indigènes au Canada; elles ont dû être introduites en provenance de sites faisant maintenant partie des États-Unis. L'histoire horticole de treize (13) autres espèces nous porte à croire qu'elles aussi ont été introduites dans les jardins francais en provenance du sud de l'actuelle frontière. Six (6) espèces dont le passé horticole nous est peu connu auraient pu provenir de l'un ou l'autre pays. Douze (12) espèces semblent être passées à l'horticulture francaise directement des limites actuelles du Canada. De celles-ci, onze (11) auraient été obtenues de la région de la ville de Québec, mais au moins une, d'après sa distribution, aurait été cueillie près de la Baie Géorgienne.

Canadensium Plantarum Historia, by Jacques-Philippe Cornut, published in 1635, has been recognized as the first botanical work on the plants of North America north of México, although, as the secondary phrases in its long title indicate, it was not devoted exclusively to North American plants. More specifically, but less accurately, some recent authors have credited Cornut with having written "the first Canadian flora." Several North American species were described for the first time in Cornut's *Historia.* Its significance is further enhanced by a number of citations of this work by Linnaeus in his *Species Plantarum* (Reveal, 1983) and by other authors of nomenclaturally significant publications.

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1. Contribution No. 63 from the Royal Botanical Gardens, Hamilton, Ontario

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Traduction de Céline Arsenault, Jardin botanique de Montreal

Because of the early date of the *Historia,* there has been considerable speculation as to the source of the plants studied by Cornut. Cornut himself did not visit Canada or any other part of the Americas. He observed most of the North American species in the garden of the Faculty of Medicine at Paris. The curator at that time was Vespasien Robin, who had succeeded his father, Jean Robin. Other species from North America were studied by Cornut in the gardens and nurseries of the Morin family, also in Paris (Stannard, 1966). There is considerable literature on the Robins and the Morins, but it does not appear adequately to have been taken into consideration during studies of Cornut's *Historia*. The speculation about the sources of Cornut's "Canadian" plants seems to have been based largely on the history of French exploration and settlement in Canada. In general, discussions of Cornut's *Historia* appear to have given too little attention to the natural geographic ranges of the plants described therein.

The name "Canada" was, of course, applied in widely different senses in the seventeenth and eighteenth centuries. Some authors applied the name only to the area along the St. Lawrence River or even confined its application to the vicinity of Québec City, whereas, as noted by Rousseau (1957), " 'Canada' prior to 1760," in some applications of the name, "extended from the valley of the St. Lawrence to Louisiana." There appears to have been a tendency among English authors during this period, who were accustomed for other names for regions under British control, to apply the name "Canada" to regions occupied by the French, whereas French authors tended to use the name in a broader sense. Some European writers appear to have applied the name "Canada" to much or all of eastern North America. Nevertheless, in discussions of Cornut's *Historia,* "Canada" appears generally to have been equated with present-day eastern Canada, probably in part because the present boundary corresponds approximately to the boundary between French and British North America before the French and Indian War, but probably also because of an uncritical tendency among some authors to associate early uses of the name "Canada" with its present meaning.

In this study, the identities of the plant species described by Cornut, except as indicated below, follow Stannard (1966) and the additions and corrections made by DeWolf (1974). Two changes made by Dr. Thomas H. Cain in annotations to the copy at the Royal Botanical Gardens are also accepted. These and changes made during the present study are noted below, along with updating of the nomenclature. Stannard's (1966) use of some names that were not used in any standard North American floras later than the sixth (1890) edition of *Gray's Manual* indicates that some identifications were taken directly from much earlier studies.

Eruca maxima Canadensis may be *Rorippa palustris* (L.) Bess. ssp. *hispida* (Desv.) Jonsell, but, in the absence of an illustration, it cannot be identified with sufficient certainty to permit its discussion in the present analysis.

Valeriana urticaefolia flora violaceo is probably not a North American species. It may be a species of *Valeriana* in the present sense, or of *Centranthus, Knautia, Scabiosa,* or *Trachelium,* although it is difficult to account for the stipules shown prominently in the illustration of this taxon (but absent, as they should be, from the illustration of *Valeriana urticaefolia flore albo,* which has consistently been identified as *Eupatorium rugosum* Houtt.). Possibly basal lobes of the leaves were misinterpreted. Because of the stipules and the strongly curved styles, this does not appear to be one of the violet-flowered species of *Eupatorium.*

Polygonatum ramosum flore luteo maius and *Polygonatum ramosum flore luteo minus* are both clearly illustrated as having strongly perfoliate leaves. Since there are only two species of *Uvularia* with perfoliate leaves, *"maius"* must be *U. grandiflora* Sm. and *"minus"* must be *U. perfoliata* L. Cornut described the flowers of *"minus"* as being not only smaller than those of *"maius"* but also paler, just as they were contrasted by Fernald (1950).

Fumaria siliquosa sempervirens, although previously identified as *Dicentra canadensis* (Goldie) Walpole, is undoubtedly *Corydalis sempervirens* (L.) Pers., as annotated by Dr. Cain, and also indicated, through association with Linnaeus's *Fumaria sempervirens*, in Reveal (1983). This is evident not only from the illustrations of the flowers but also from Cornut's description of them as flesh-coloured ("carneo") and gold ("aureo").

Following Gillis's (1971) monograph on the poison ivies, Cornut's *Edera trifolia Canadensis* can be identified as *Toxicodendron rydbergii* (Small ex Rydb.) Greene, the northernmost of the several taxa included in *Rhus toxicodendron* L. in earlier literature.

Since the name *Parthenocissus quinquefolia* (L.) Planch. has been used in differing circumscriptions, it should be noted that Cornut's *Edera quinquefolia Canadensis* is *P. quinquefolia* in the strict sense, as indicated by the clearly depicted adhesive discs terminating the branches of the tendrils.

Fumaria tuberosa insipida, although previously identified as *Dicentra cucullaria* (L.) Bernh., is obviously *D. canadensis* (Goldie) Walpole. The shape and position of the tubers identify Cornut's plant as this species (cf. illustrations and descriptions by Stern, 1961).

Cornut's *Cerefolium latifolium Canadense* seems definitely enough to be *Chaerophyllum procumbens* (L.) Crantz to permit its discussion as such in this analysis. This is the most northerly ranging species of *Chaerophyllum* in the "Gray's Manual range."

Vitis laciniatis foliis seems to have been called "perhaps *V. riparia* Michx." by Stannard only because it was assumed to be a Canadian species, *V. riparia* being the only widespread native grape species in present-day eastern Canada. However, the deeply lobed leaves for which Cornut named this species are not at all characteristic of *V. riparia*. This species was not identified as being "Canadian" by Cornut, and his description and illustration appear to conform more closely to the European *V. vinifera* L. 'Apiifolia', which was widely cultivated in England and France in Cornut's time.

The name *Eupatorium purpureum* L. has been used in both strict and broad senses. In considering the identity of Cornut's *Eupatoria foliis enulae, E. purpureum* in the strict sense can be eliminated, because its stems are solid, whereas the plant described by Cornut was said to have hollow stems ("inanes intus"). Of the three remaining species of Joe-Pye-weed recognized by Wiegand (1920) and Fernald (1950), *E. dubium* Willd. can probably be eliminated on the basis of its leaf shape. Although, according to Wiegand (1920), it only infrequently has hollow stems, the wide-ranging *E. maculatum* L. appears to be the species described by Cornut. His illustration appears to represent the broad, flat-topped inflorescence of this species, rather than the more elongate, dome-shaped inflorescence of the more southern *E. fistulosum* Barrett.

Cornut's *Apios Americana* is doubtless correctly identified as *Apios americana* Medik., but it is interesting to note Cornut's mention of the seeds both in his description of the species and in his indication that Robin's plants had been raised from seed. Seed-bearing plants, which are diploid, are known only from the southern part of the range of this species, north to ca. 42° 30' N. In the northern part of its range, this species comprises triploid plants, which do not set seed (Seabrook & Dionne, 1976; Bruneau & Anderson, 1986). In both of these studies it was reported that "no plants north of Massachusetts have ever been observed to set seed."

Calceolus Marianus Canadensis, although identified by DeWolf (1974) as *Cypripedium reginae* Walt., is doubtless *C. calceolus* L. in the broad sense, as noted by Dr. Cain. Cornut described the lip as being yellow ("utriculus subrotundus, colore luteus").

Herbatum Canadensium, sive Panaces moschatum, which was not illustrated, defies definite identification. Because of its variable leaves, Stannard suggested that it might be a species of *Prenanthes,* but this seems incompatible with Cornut's description of it as having basal leaves a foot long and as having a pleasant, musky odour so strong that it can be detected from afar. It might be *Petasites palmatus* (Ait.) A. Gray, induced to flower out of season by the weather conditions in Paris at the time, or perhaps *Heracleum maximum* Bartr. The spathe of *Statiche maxima Americana*, to which Cornut gave particular attention in his description of the species, suggests *Allium*, but the combination of floral and foliar characters does not bring to mind any American species of that genus. Too little information on *Radix Sanqroel nothae Angliae* is presented to permit speculation as to its identity, many diverse plants having been employed as remedies for snakebite.

There has been no question about the identity of Cornut's *Acacia Americana Robini* as *Robinia pseudoacacia* L. and *Gelseminum Ederaceum Indicum* as *Campsis radicans* (L.) Seem. It should be noted, however, that these are North American species, although neither was annotated as such in Stannard's (1966) list. The latter species was said by Cornut to have come from the Indies, but seventeenth-century European usage sometimes applied the term West Indies to parts of the southeastern mainland of North America as well as to the islands.

The currently accepted names for the species designated *Eupatorium ageratoides* L., *Actaea alba* (L.) Mill., *Poterium canadense* Benth. & Hook., and *Apios tuberosa* Moench by Stannard (1966) are, respectively, *Eupatorium rugosum* Houtt. (or in some recent classifications, *Ageratina altissima* (L.) King & Robinson), *Actaea pachypoda* Ell., *Sanguisorba canadensis* L., and *Apios americana* Medik.

Cornut's *Althaea rosea peregrina* has often been identified with *Hibiscus moscheutos* L., an American species, following Linnaeus's *Species Plantarum*. In this study, however, I have followed Fernald (1942), who concluded from details of the calyces shown in Cornut's illustration, and from the branching pattern, that this description was not based on a species from North America. The combination of roseate corollas and unlobed leaves would also be difficult to reconcile with its identification as a North American species. If Cornut's *Althaea rosea peregrina* actually was *H. moscheutos* or *H. palustris* L., the comments

made here with regard to such species as *Campsis radicans* would also be applicable to it.

Therefore, the species listed below are the North American species described by Cornut that are considered in the present analysis. The sequence in this list is that of Cornut; the names are those in current use.

Cystopteris bulbifera (L.) Bernh.
Adiantum pedatum L.
Monarda fistulosa L.
Eupatorium rugosum Houtt.
Asarum canadense L.
Smilacina stellata (L.) Desf.
Smilacina racemosa (L.) Desf.
Uvularia grandiflora Sm.
Uvularia perfoliata L.
Desmodium canadense (L.) DC.
Corydalis sempervirens (L.) Pers.
Aquilegia canadensis L.
Helenium autumnale L.
Aster cordifolius L.
Aralia racemosa L.
Actaea pachypoda Ell.
Actaea rubra (Ait.) Willd.
Asclepias syriaca L.
Asclepias incarnata L.
Toxicodendron rydbergii (Small ex Rydb.) Greene
Parthenocissus quinquefolia (L.) Planch.
Campsis radicans (L.) Seem.
Dicentra canadensis (Goldie) Walpole
Polanisia graveolens Raf.
Rubus odoratus L.
Trillium erectum L.
Solidago sempervirens L.
Robinia pseudoacacia L.
Sanguisorba canadensis L.
Chaerophyllum procumbens (L.) Crantz
Rudbeckia laciniata L.
Eupatorium maculatum L.
Erigeron annuus (L.) Pers.
Angelica lucida L.
Angelica atropurpurea L.
Apios americana Medik.
Cypripedium calceolus L.
Sanguinaria canadensis L.

Details of the distribution of species in the southern part of the province of Québec have been determined from maps in Rousseau (1974). Otherwise, except where specific references are cited, ranges have been determined from Fernald (1950) and other standard floras for eastern North America.

Probably the person most often mentioned as a possible collector of the plants described by Cornut is Louis Hébert, an apothecary from Paris. Hébert had come to the new French colony of Port-Royal (now Annapolis Royal, Nova Scotia) with the Biencourt de Poutrincourt commercial expedition in the spring of 1606, and had begun growing vegetables and treating the sick. Later that year, he left Marc Lescarbot in charge of the gardens and (along with Champlain) became a member of du Gua de Monts expedition of 1606-1607, which explored the Atlantic coast from present-day southern Nova Scotia to Rhode Island, concentrating especially on the vicinity of Cape Ann, after which he returned to France. He came back to Port-Royal as a colonist in 1610, and remained until 1613. In 1617, he, his wife and their three children became residents of Champlain's colony at Québec, where he remained until his death in 1627 (Bennett, 1966). Hébert, therefore, was in Canada early enough to have sent the plants seen by Cornut, and, as an apothecary, he presumably would have had the knowledge and interest that might have led to a contribution of plants to the Faculty of Medicine.

It has also been suggested that some of the North American plants described by Cornut might have been brought to France by Jacques Cartier. Cartier explored the vicinity of the Gulf of St. Lawrence in 1534, but did not proceed upstream much beyond Anticosti. His second expedition advanced upstream as far as Montréal in 1535, but suffered a severe winter at the present site of Québec City, during which many of the party died; the survivors returned to France in the spring of 1536. A third expedition in 1541-1542 went as far as the site of Québec City (Rousseau, 1937; Trudel, 1966a). Cartier is known to

have brought Canadian plants back to France. Thévet, in his *Cosmographie Universelle* (quoted in Rousseau, 1954), noted that "a number of plants and shrubs," and also some trees, brought from Canada by the Cartier expeditions, could still be seen as of 1575 in the Royal Garden at Fontainebleau. Among these was *Acer saccharum* Marsh. The introduction of *Thuja occidentalis* L., which was widely established in European horticulture by the beginning of the seventeenth century, has generally been attributed to Cartier (Rousseau, 1954, 1957; Warner, 1956; Allen, 1964; Leith-Ross, 1984) — not surprisingly, since this species has been credited with having kept Cartier and the surviving members of his party alive during the winter of 1535-1536 (Rousseau, 1954).

Rousseau (1957), however, although he mentioned Hébert, said that the Canadian plants described by Cornut "could only have come from Samuel de Champlain or one of his companions." Champlain first came to New France in 1603, as a member of Grevé du Pont's expedition, which traveled up the St. Lawrence as far as the site of Montréal, where the party spent the summer. From 1604 to 1607, Champlain was geographer on du Mont's expedition that explored the coast from Nova Scotia to Rhode Island. The last region visited by this expedition was Nova Scotia, where much of the summer of 1607 was spent. This was presumably the only region from which Champlain or Hébert would have had any opportunity to bring plants to France, since it was the only region they visited after the expedition wintered at the site of Québec City. The party was joined for the return to France by the Biencourt de Poutrincourt expedition, which had come to Port-Royal in 1606. In the latter expedition was Marc Lescarbot, who had been in charge of the gardens at Port-Royal, and who had taught the skills of gardening to the settlers. Lescarbot is recorded as having introduced the Jerusalem artichoke to France (Salaman, 1940). Three more expeditions, these led by Champlain himself, followed in 1608, 1609 and 1610; Québec City was founded, as a trading post, on the first of these. In 1611, Champlain traveled upstream as far as Montréal. His planting of roses at Québec the same year may be the earliest record of ornamental horticulture in Canada. In 1613, he explored the Ottawa River; in 1615, with Huron allies, he made an unsuccessful raid against the Iroquois in present-day New York (discussed further below). He returned briefly to France in 1617 and 1618. In 1620, he and his wife became residents of Québec, where he initiated major building projects. He was at Québec until 1624 and again from 1626 to 1629. Champlain was well qualified as a geographer, and his writings indicate a strong interest in many aspects of the natural sciences (Trudel, 1966b).

According to Rousseau (1957), "Cornut's preface pays homage to an illustrious French voyageur, but unfortunately he omits the name" (translation). As I interpret the opening passage of Cornut's "Ad lectorum," however, it appears to be a general tribute, using a generic singular, to the explorer "who, with an indefatigable spirit, not frightened by intolerable labour, not so much for the sake of gaining wealth as in zeal for research, crossing whatever ocean, discovers new lands"; and, in particular, to him who "from each of the Americas and especially from the Indies sends back plants unknown to all the ancients" (translation). It does not, from this wording, appear to be a tribute to any one individual explorer.

French explorers and colonists, however, were by no means the only source of North American plants in French gardens in the seventeenth century. For over 30 years prior to the publication of Cornut's *Historia*, a number of gardeners and nurserymen on both sides of the English Channel had been acquain-

ted with one another and had been involved in exchanges of newly introduced exotic plants. John Tradescant, Sr., and Jean Robin, and later John Tradescant, Jr., and Vespasien Robin, were particularly good friends and were especially active in the exchange of plants. Réné and Pierre Morin in France also participated in such exchanges, as did John Parkinson (apothecary, horticulturist, and author of *Theatrum Botanicum*) in England (Warner, 1956; Allen, 1964; Coats, 1969; Fisher, 1982; Leith-Ross, 1984, esp. p. 36). Caspar Bauhin in Basel, Switzerland, and some Italian horticulturists also received new plant introductions, including North American species, from the Robins ca. 1622 (Warner, 1956).

John Tradescant, Sr., Royal Gardener to Charles I of England, assiduously pursued sources of exotic plants, asking persons traveling to distant lands to bring back plants and also requesting the Secretary of the Navy to urge others to do so. Tradescant was especially interested in Virginia, and was himself, as of 1617, an investor in the Virginia Company, which had established the English colony at Jamestown in 1607. Consequently, Tradescant had received plants from Virginia since shortly after its first English settlement. Lists of the plants in their gardens, complied by the Tradescants in 1629, 1633, 1634 and 1656 (reproduced in Leith-Ross, 1984, and elsewhere) record that the senior Tradescant had received directly from Virginia, at a very early date, a number of plant species that were later grown by the Robins and the Morins. These lists also indicate that Jean Robin, prior to his death in 1629, had been able to reciprocate with a few North American species (discussed below) collected by French explorers, although most of the Robins' contributions to this exchange consisted of plants of other than North American origin. Conversely, Rousseau (1957) has noted that the Robins' lists of plants grown in the Royal Gardens in France indicate a significant influx of North American species during the first quarter of the seventeenth century; a number of these were not native to those parts of the continent explored or colonized by the French, and were probably acquired from Tradescant. In summary, by 1635, there were a substantial number of North American species in French as well as English gardens, the majority of them from Virginia and adjacent parts of the present United States. It cannot be assumed that the plants studied by Cornut must have been collected by French explorers.

The first list (as distinguished from descriptions) of the plants in the Robins' gardens was Jean Robin's *Catalogus*, published in 1601. In discussing this list, Warner (1956) stated that there were two North American species already in the Robins' possession by 1601, *Thuja occidentalis,* which had frequently been noted, and *Actaea spicata*, which had been overlooked. She further noted, as evidence of the early introduction of *A. spicata* from North America, that John Gerard, in his *Herbal* of 1597, had included "*Christophoriana*, identified as *A. spictata*, which he had received from Jean Robin." (Quotation marks here designate material from Warner.) *Actaea spicata* L., however, is native to much of continental Europe and a limited area in Britain, not to North America. (The North American *A. rubra* was classified as *A. spicata* var. *rubra* Ait. in some nineteenth-century floras, but not in any that were standard at the time of Warner's studies.) *Actaea spicata* differs from either of the North American species in having black fruits. Gerard's description of *Christophoriana* makes no mention of fruit colour, nor does the name *Aconitum racemosum sive Christophoriana* used for the species in question in Robin's *Catalogus* appear to distinguish the plant in his garden from the native species with which he would have been familiar. It appears, therefore, that the species

mentioned in Gerard's *Herbal* and Robin's *Catalogus* was the European *A. spicata* which is still known as herb Christopher. Allen's (1964) mention of an *Actaea* species grown by Robin as early as 1601 appears to have been based entirely on Warner's paper. Species identifiable as *Actaea* and described as having red or white fruit were first mentioned by Cornut. These presumably are of North American origin, although there is a red-fruited species, *A. erythrocarpa* L., native to eastern Europe. Evidently very few North American species had reached the Robins before 1601.

A number of the "Canadian" species described by Cornut were among those listed by the senior Tradescant as having been in his possession by 1629, 1633, or 1634. These are listed by modern names below, along with the origin ascribed to them by Tradescant. Identifications follow Leith-Ross (1984) or, in the case of the *Corydalis*, the similarity of the names used by Tradescant and Cornut.

Asarum canadense - America
Asclepias syriaca - America
Corydalis sempervirens
Cystopteris bulbifera
Erigeron annuus
Eupatorium rugosum - New York
Robinia pseudoacacia - Virginia
Rudbeckia laciniata - America
Smilacina racemosa - Virginia
Toxicodendron rydbergii - Canada

To these may be added, with less certainty, *Asclepias incarnata* and *Smilacina stellata,* which are, respectively, the probable identities of Tradescant's *Apocynum altera* and *Polygonatum altera* (Virginia). Tradescant also listed a *Solidago* species (Virginian) and at least four species of *Aster*, one of which was quite likely *A. cordifolius*. He also grew *Cypripedium calceolus* at that time, but, since varieties of this species occur on both sides of the Atlantic, one cannot assume that all introductions of this species were from the same source. With the exception of the *Toxicodendron* and possibly the *Cypripedium*, these species were probably acquired from Tradescant's associates who visited British North America, and may subsequently have been shared with Robin and/or the Morins.

Toxicodendron rydbergii, which Tradescant received in 1632 as *"Frutex Canadencis* [sic] *Epimedium folia"* (Leith-Ross, 1984, p. 186), may have been grown in France before it was grown in England, and may have been sent to Tradescant by one of his French correspondents. This is indicated by its origin having been listed as Canada, uniquely among the species named above, the relatively late date of its receipt by the senior Tradescant whereas it was well established in France no more than two years later, and by the younger Tradescant's identification of this species with the *Hedera trifolia canadensis* of Cornut.

The history of *Robinia pseudoacacia*, a species native to the Southern Appalachians, has been the subject of much study and speculation, because its natural range does not closely approach the seacoast or any site of early seventeenth-century exploration or colonization by either the French or the English. Undoubtedly, however, this species came from the present United States, probably from the highlands above the British colonies in Virginia, because it occurs only as a naturalized species in the northern United States and Canada. There is some evidence that it was one of Tradescant's earliest acquisitions from Virginia (Warner, 1956; Allen, 1964, pp. 44-45; Allen, 1974). It definitely appears to have been present for some time in England before it was grown in France.

It must also be noted that as early as 1623, Vespasien Robin had listed seven of the same species in his *Enchiridion*, along with several others subsequently described by Cornut. (Robin's *Enchiridion* of 1623 is to be distinguished from the *Enchiridion* appended by Cornut to his *Historia*.) Identifications, with one exception, follow Warner (1956), with modernized nomenclature:

Apios americana
Asarum canadense
Asclepias incarnata
Aster cordifolius
Campsis radicans
Eupatorium rugosum
Parthenocissus quinquefolia
Rudbeckia laciniata
Smilacina racemosa
Toxicodendron rydbergii
Uvularia grandiflora
Helenium autumnale

Robin's *Chrysanthemum Americanum cum volatoria caule, seu Vosacam* was identified as *Helianthus decapetalus* L. by Warner, but the binomial seems much better applicable to *Helenium autumnale*. The polynomial, moreover, resembles those applied to *H. autumnale* by other early authors, e.g. Robert Morison in his *Praeludia Botanica* and *Plantarum Historiae Universalis Oxoniensis* (see citations by Linnaeus, 1738). These species presumably had arrived in Paris between 1601, when the *Catalogus* was compiled, and 1623, when the *Enchiridion* was published. The *Enchiridion* also listed some North American species that Cornut did not describe, including:

Anaphalis margaritacea (L.) C.B. Clarke
Helianthus tuberosus L.
Lilium canadense L.
Lobelia cardinalis L.
Morus rubra L.
Rhus typhina L.
Tradescantia virginiana L.
Zephyranthes atamasca (L.) Herb.

In addition, Robin listed plants identified as *Amelanchier, Eupatorium* (purple-flowered), *Prunus, Rosa,* and *Solidago* – genera in which there are too many species of similar aspect to permit uncritical acceptance of the identifications given by Warner (1956); a few in which Warner's identifications seem suspect, such as the *Chrysanthemum Americanum* noted above; and some species impossible to identify.

Several of these species probably were introduced to France directly from French North America, where they had been discovered by French explorers. *Helianthus tuberosus* L., the Jerusalem artichoke, was already widely cultivated in Europe by 1623. Salaman's (1940) study of its history indicates that it was probably brought to France by Marc Lescarbot or Louis Hébert on the return voyage of the du Mont expedition of 1607. The Scottish botanist Robert Morison first described the species now called *Helenium autumnale* from plants seen in Blois, France (as indicated by Linnaeus, 1738). Evidence that *Lilium canadense* and *Lobelia cardinalis* were also introduced directly to France is presented elsewhere in this paper, and the delayed appearance of *Anaphalis margaritacea* in English lists indicates that it, too, had a similar history.

Such a history, however, would not be credible for *Campsis radicans, Morus rubra, Parthenocissus quinquefolia, Tradescantia virginiana,* or *Zephyranthes atamasca.* These species are not native to areas then occupied by the French. In relation to present boundaries, they are not native to Canada except for a few populations of *C. radicans* and *P. quinquefolia* in the area from Amherstburg to Point Pelee, and an only slightly wider natural range of *M. rubra* in southernmost Ontario. The only European explorations and settlements in the ranges of these species until much later than 1623 were British or Dutch, in the present United States. Most of these species were among those designated "Virginian" in Robin's *Enchiridion*. Their inclusion in this publication indicates,

therefore, that between 1601 and 1623 Robin had been obtaining plants from British North America, including a few that were not included in Tradescant's lists of 1629-1634. Nevertheless, since horticultural exploration by French nationals in British North America at that time would have been unlikely, it is probable that the Robins' plants from British North America reached Paris via British horticulturists.*Uvularia grandiflora*, the only other species described by Cornut that was listed in Robin's *Enchiridion* but not by the senior Tradescant, is widely distributed in eastern Canada and the United States and could have been collected in either then-French or British North America. *Rhus typhina*, which was listed by both Tradescant (as *Rhus virginiana*) and Robin, and also by Parkinson, but not described by Cornut, was acquired by Tradescant directly from British North America, probably from Virginia (Allen, 1974); Robin's plants may have been derived from the same introduction.

The fertile race of *Apios americana*, also, is not native to those areas of North America that were occupied by the French. The earliest publication on *A. americana* is evidently that of Père Pierre Biard, who mentioned this species in his *Relations* published in 1616. Père Biard came to Port-Royal as one of its first two priests in 1611, whereupon "he immediately evinced his interest in the food plants of the colony and is credited with sending tubers straightway to France" (Salaman, 1940). If this introduction of *A. americana* to France was of native Nova Scotian material, it would have the sterile form; Seabrook & Dionne (1976) sampled ten populations in Nova Scotia and New Brunswick and found all to be triploid. If, however, Biard had sent cultivated material derived from tubers brought to Port-Royal by Champlain, who had noted this species and its edible qualities on Cape Cod in 1605 (Salaman, 1940), it is possible that it was the fertile form. Robin, in his *Enchiridion* of 1623, referred to the *Apios* in his garden as *Apios americana foliis phaseoli floribus obsoletis*, but since the sterile form has showy flowers, it is not clear whether this indicates that the sterile race was present in his garden at the time. Cornut's reference to this species' having reached full maturity four years after the seed was sown might, although not necessarily, reflect his having had four years in which to observe a more recent introduction. There was no mention of *"floribus obsoletis"* in Cornut's account.

In his 1656 catalogue, the younger Tradescant listed several more of the species that by then had been described by Cornut, three of which had also been listed by Robin in the *Enchiridion*:

Campsis radicans - America
Eupatorium maculatum - New England
Parthenocissus quinquefolia - Virginia
Rubus odoratus
Sanguinaria canadensis - Virginia

By 1656, of course, French and British horticulturists could independently have acquired these species. However, because of their ranges, discussed above, it is virtually certain that all plants of *C. radicans* and *P. quinquefolius* then cultivated in Europe were derived from collections made in the present United States, in all probability by British collectors. The other species range much farther north, but, since at least two of them were introduced to England from the present United States in the mid-seventeenth century, as indicated by Tradescant's notes, it seems not unlikely that those in French gardens were derived, via England, from the same source.

Seven species, namely *Actaea pachypoda, Actaea rubra, Adiantum pedatum, Aquilegia canadensis, Desmodium canadense, Monarda fistulosa,* and

Trillium erectum, seem definitely to have been brought to France before they were cultivated in England. This does suggest that they were first sent to Europe by a French explorer. Two other species, *Dicentra canadensis* and *Sanguisorba canadensis*, may tentatively be added to this list, although their history in European horticulture is less clear.

As noted above, nomenclatural problems and the similarity of Eurasian and North American species present difficulties in interpreting references to *Actaea*, as does the fact that *A. rubra* may have either red or white fruits. According to Leith-Ross (1984), the "supposed Wolfes bane of America," identified as *A. pachypoda*, was first obtained from Canada by Robin; Tradescant acquired his plant from Robin and, after it had increased, passed the species on to Parkinson. Also according to Leith-Ross (1984), Tradescant's list indicates that he likewise acquired *A. rubra* from Robin. She also concluded that *Aquilegia canadensis*, which Tradescant received in 1637, two years after it had been described by Cornut, probably also came from a Parisian source. Allen (1974 ; see also Fisher, 1982) has reported that the Robins provided Tradescant with his *Rudbeckia laciniata*, indicating that it too may have a Canada-to-France-to-England history.

Adiantum pedatum does not appear to have been known in English gardens until it was brought from Virginia by the younger Tradescant, upon returning from his own voyage in 1638, three years after it had been described by Cornut. (The Tradescants had grown *A. capillus-veneris* L. earlier, but Cornut's illustration clearly shows *A. pedatum*, not the more southern species.) The attractive *Trillium erectum*, despite its abundance in New England, was not introduced into England until 1759, according to *The Illustrated Dictionary of Gardening* (Nicholson, ed., 1884-1887); no *Trillium* species appear in any of the Tradescants' lists or in Parkinson's *Theatrum.*

Desmodium canadense is first recorded in English horticulture in 1640 (Nicholson, ed., 1884-1887). Its earlier known presence in France and its association with the name "Canada" throughout its horticultural history suggest that it may first have been introduced to France. A similar history can be postulated for *Dicentra canadensis* and *Sanguisorba canadensis*, but on no better evidence than the absence of their names from the Tradescants' lists and other early English records, whereas they were known to Cornut. The history of *Dicentra canadensis* is obscured by the failure of early authors, including Linnaeus, to distinguish it from *D. cucullaria* (L.) Bernh. (*Dicentra canadensis* was illustrated only in leaf by Cornut, and presumably Linnaeus did not see the distinctively different flowers of this species.)

The *Actaea, Adiantum, Aquilegia, Desmodium, Dicentra, Helenium, Rudbeckia, Sanguisorba*, and *Trillium* species all range as far northeast as Québec City (Rousseau, 1974), and therefore could have been encountered by the Cartier expeditions. These species could also have been sent to France by the Récollet missionaries at Québec (infra), or by Champlain or Hébert if, as seems not unlikely, they did collect plants for this purpose. The *Actaea, Adiantum, Rudbeckia, Sanguisorba,* and *Trillium* species are also native to Nova Scotia, and could have been brought to France by Lescarbot or sent by Biard.

Monarda fistulosa appears unlikely to have been collected by any of the individuals or expeditions mentioned above. According to Leigh-Ross (1984), "a wild mint of America," identified as this species, "was hastily added to the appendix at the back of [Parkinson's] *Theatrum,"* published in 1640, "with no

ORIGANVM FISTVLOSVM CAN.

Fig. 2. Cornut's illustration of *Origanum fistulosum canadense* (identified as *Monarda fistulosa* L.).

attribution for its arrival." In the absence of any earlier record of *M. fistulosa* in England, this "hasty addition" seems to indicate that it was introduced into England very shortly before the publication of the *Theatrum*, although it had been described by Cornut in 1635. The fact that the younger Tradescant, in 1656, used the same name for this species that Cornut had used, and attributed its origin to Canada, further supports the belief that *M. fistulosa* was introduced to England from France. Also, whereas Cornut had indicated that several species were "native to Canada," he used unique wording in discussing this species, saying that it had "recently arrived from Canada."

The range of *Monarda fistulosa* is indicated in Fig.1. Hébert was never anywhere near the range of this species. Cartier was never within its range except shortly before the winter of 1535-1536, when his party was nearly wiped out by cold and scurvy; he had no opportunity to collect this species after his recovery. Champlain might possibly have encountered *M. fistulosa* in 1611 at Montréal, but his only entry into the range of this species beyond its extreme limits was in 1615-1616, immediately before and after his unsuccessful sortie against the Iroquois. It is unlikely that Champlain, who left the land of the Hurons in early spring, would have collected this summer-flowering species before doing so. Also, introduction of this species to France in 1616 would have been incompatible with Cornut's mention of its "recent" arrival in 1635.

The only Frenchmen who resided within the range of *M. fistulosa* prior to 1634 were the missionaries to the Hurons, initially of the Récollet order, later joined by Jesuits. Récollet priests and lay brothers established the headquarters for their missions in New France on the Rivière St. Charles at Québec in 1615, and a mission to the Hurons near the present site of Lafontaine, Ontario, in 1623. Although they have rarely if ever been mentioned in horticultural history, they did send some ornamental plants from Québec to France, including the species now known as *Lilium canadense* L. and *Lobelia cardinalis* L., as recorded by Sagard (1632, p. 51 of English transl.). Although these species did not "come to perfection [in France] as they do in their native soil," it appears that they survived long and well enough to have been listed in Robin's *Enchiridion* in 1623. They also appear to have flourished sufficiently for Robin to share them with Tradescant, who recorded having received *Lobelia cardinalis* from Jean Robin prior to 1629, and *Lilium canadense* in or before 1633. (*Lobelia cardinalis* was in England by 1626, according to Nicholson, ed., 1884-1887.) Parkinson (quoted in Coats, 1969) noted that his *Lilium canadense* had been found "neere the river of Canada, where the French plantation in America is seated."

The man who recorded the introduction of Canadian plants to France by the Récollets was the lay brother Gabriel Sagard (to which name he added Théobat upon entering missionary service). Sagard was one of the missionaries in the homeland of the Hurons ("Huronia") in 1623-1624 (Wrong, in 1939 ed. of Sagard, 1632; Rioux, 1966). He was greatly interested in various branches of natural history, and noted (Sagard, 1632, pp. 239-241 of English transl.) a number of plants in Huronia that he had not seen elsewhere. Among these were plants readily identifiable as *Allium tricoccum* Ait., *Lilium philadelphicum* L. and *Sarracenia purpurea* L., one that appears to have been *Helianthus tuberosus*, and another that appears perhaps to have been *Erythronium albidum* Nutt., although that species is not currently known from Simcoe County (Reznicek & Bobbette, 1974). He also noted the presence of many fruits and nuts, some identified by him with their European relatives, others unfamiliar, including

Fig. 3. Distribution of *Monarda fistulosa* L. in eastern North America, from maps by McClintock & Epling (1942), Scora (1967), and Rousseau (1974).

blueberries, strawberries, wintergreen, hawthorns, cranberries, chokecherries, plums, saskatoons, raspberries, currants, grapes, beeches, and hazels. He mentioned several other utilitarian plants, which, however, were not described in enough detail for positive identification. Although Sagard did not specifically mention having sent plants from the Huron country to France, his keen interest in both useful and ornamental plants and his past involvement in sending plants from Québec, makes it seem likely that he sent plants from this region as well.

Among the plants mentioned by Sagard was an herb "which in taste and shape resembles the wild sweet marjoram" ("marjolaine sauvage"). The description is not sufficient for definite identification. In the 1939 edition of *Le Grand Voyage*, it is suggested, probably following Jacques Rousseau, that this plant might have been *Hedeoma pulegioides* (L.) Pers. This species, although it does occur sporadically throughout southern Ontario, is uncommon in calcareous regions and is unknown from present-day Simcoe County (Reznicek & Bobbette, 1974); it is unlikely, therefore, that it would have been known to Sagard, and even less likely that it would have been given a prominent place in his writings. The plant known in France as marjolaine sauvage is *Origanum vulgare* L., which was also designated an *Origanum* in pre-Linnaean botanical literature. Despite its much larger flowers, the species now called *Monarda fistulosa* was also called an *Origanum* (*"Origanum fistulosum canadense"*) by Cornut and later by the younger Tradescant. It seems possible, therefore, that the marjoram-like plant of which Sagard took special note, considering it to be of culinary value, was selected by him for shipment to France; and that in assigning *M. fistulosa* to *Origanum* Cornut was influenced, indirectly, by a communication from Sagard to the original French recipient likening this species to the European wild sweet marjoram.

Sagard received orders to return to France in 1624, and his colleague Père Nicolas Viel was murdered the following year. The Récollet mission to the Hurons was resumed in the summer of 1626 by Père Joseph de la Roche Daillon. La Roche was also an explorer, who traveled south to the territory of the Neutral Nation in an unsuccessful attempt at evangelism (Gingras, 1966). He was soon joined in the Huron mission by the Jesuit priests Père (posthumously Saint) Jean de Brébeuf and Père Anne de Moue. The latter returned to Québec the following spring, but La Roche and Brébeuf remained, establishing their mission at Toanché, near the site of the present community of that name north of Penetanguishene.

Père La Roche returned to Québec in the summer of 1628 in quest of supplies to relieve the food shortage in Huronia; he was described as "emaciated." There were no food supplies available, however, because hostilities with Britain had prevented any French ships from reaching Québec that year. Père Brébeuf, after a harsh winter at Toanché, was "recalled in haste" to Québec the following summer, with instructions to bring with him all the corn he could obtain from the Hurons. Québec was surrendered to the Kirke brothers shortly after Brébeuf's arrival, and all the French were summarily deported to France (Paquin, 1932; Talbot, 1949; Latourelle, 1966).

These were hardly the circumstances under which ornamental plants could have been collected for gardens in Paris. There was no French presence in Huronia until Brébeuf returned in 1634, too late for any plants he might have sent back to have been described by Cornut. Père Pierre-Joseph-Marie Chaumont, the next French missionary-explorer in Huronia, did not arrive until 1639. Therefore, although Brébeuf cannot absolutely be ruled out as the pos-

sible collector of *M. fistulosa*, Sagard still appears more likely to have sent this species to France.

Although they could hardly be considered residents in Huronia, there were from time to time other Frenchmen present during the period from 1623 to 1629, "agents" of commercial companies, few of whose names have been recorded. To the dismay of the missionaries, they sometimes used the mission sites as bases of operations, but they had no other connection with the missions. It seems unlikely, from the missionaries' accounts of the "agents," that they were responsible for any introductions of North American plants to French gardens.

If in fact Gabriel Sagard did bring or send *Monarda fistulosa* to France, it is highly probable that he brought or sent other species from Huronia as well. *Monarda fistulosa*, however, is unique in that no other history of its introduction to French horticulture appears likely.

The remaining North American species, not hitherto discussed, among those described by Cornut are:

Angelica atropurpurea
Angelica lucida
Aralia racemosa
Chaerophyllum procumbens
Polanisia graveolens
Uvularia perfoliata

Of these six species, three, *C. procumbens, P. graveolens,* and *U. perfoliata*, are native in Canada only to a small area in southernmost Ontario, mostly near Lake Erie, where there had been no visits by either the French or the English prior to 1635. It is highly probable, therefore, that these species all came from the present United States. The other three species are much more widely distributed in Canada, ranging at least as far north as Québec City (Rousseau, 1974), but also occur as far south along the Atlantic seaboard as New York or in some cases to Virginia or farther; these could have been collected in either present-day country. Moreover, in view of the similar aspect of many Apiaceae, it is possible that some of the species in that family that were described by Cornut were also listed by the Tradescants, but that modern botanists have not recognized the different names as having been applied to the same species.

In summary, consideration of the ranges of the 38 identifiable North American species described by Cornut, in conjunction with the history of French and British exploration and settlement of North America, indicates that 7 species could hardly have been collected in present-day Canada, but must instead have been obtained from sites in the present United States. The horticultural history of an additional 13 species indicates that they had been brought directly from the present United States (most from Virginia, a few from New York or New England) to England prior to 1635; these quite likely were sent from England to French horticulturists. This is probably the history of the plants of these species studied by Cornut, although a separate introduction to France from present-day Canada is not impossible. Six species having wide geographic ranges and poorly recorded histories in European horticulture could have come from either present country. Eight species appear very probably to have been brought or sent directly to France by French explorers and missionaries in present-day Canada, and there are indications that as many as 4 more may have a similar history. Of these 12, 11 could well have been obtained in the vicinity of Québec City by any of several explorers, missionaries, or settlers, but one appears probably to have been acquired from the Huron country near

the south end of Georgian Bay, and others of the 12 could also have come from this region as well.

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Appendix. Common names in current use for plants described by Cornut. *Newcomb's Wildflower Guide* (Newcomb, L. 1977. Boston & Toronto: Little, Brown and Company. xxii + 190 pp.) is followed wherever possible.

It should be noted that in common usage some names, e.g. Virginia creeper, are applied to related species in addition to the one described by Cornut, and other names, such as wild bean or spikenard, may also be applied to species in different genera or families.

Actaea pachypoda - white baneberry
Actaea rubra - red baneberry
Adiantum pedatum - maidenhair fern
Angelica atropurpurea - great angelica
Angelica lucida - seaside angelica
Apios americana - wild bean
Aquilegia canadensis - wild columbine
Aralia racemosa - spikenard
Asarum canadense - wild ginger
Asclepias incarnata - swamp milkweed
Asclepias syriaca - common milkweed
Aster cordifolius - heart-leaved aster
Campsis radicans - cross vine
Chaerophyllum procumbens - spreading chervil
Corydalis sempervirens - pink corydalis
Cypripedium calceolus - yellow lady's slipper
Cystopteris bulbifera - bulblet fern
Desmondium canadense - showy tick-trefoil
Dicentra canadensis - squirrel corn
Erigeron annuus - daisy fleabane
Eupatorium maculatum - spotted Joe-Pye weed
Eupatorium rugosum - white snakeroot
Helenium autumnale - sneezeweed
Monarda fistulosa - wild bergamot
Parthenocissus quinquefolia - Virginia creeper
Polanisia graveolens - clammyweed
Robinia pseudoacacia - black locust
Rubus odoratus - purple-flowering raspberry
Rudbeckia laciniata - tall coneflower
Sanguinaria canadensis - bloodroot
Sanguisorba canadensis - Canadian burnet
Smilacina racemosa - false Solomon's seal
Smilacina stellata - star-flowered Solomon's seal
Solidago sempervirens - seaside goldenrod
Toxicodendron rydbergii - poison ivy
Trillium erectum - red trillium
Uvularia grandiflora - large-flowered bellwort
Uvularia perfoliata - bellwort

Jewell David Sornborger, ca. 1895.

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JEWELL DAVID SORNBORGER (1869-1929) AN EARLY BIOLOGICAL EXPLORER IN NEWFOUNDLAND AND LABRADOR [1]

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Abstract

Jewell David Sornborger (1869-1929), as a student and later as a staff ornithologist at Harvard University, collected biological specimens along the Coast of Labrador in 1892 and 1897 and on islands off Newfoundland in 1903, thereby adding to the knowledge of the distribution of many plant and animal species. Several specimens of plants and mammals represented taxa new to science and served as type specimens.

Resume

Étudiant et plus tard ornithologue à l'Harvard University, Jewell David Sornborger (1869-1929) récolta divers spécimens biologiques le long de la côte du Labrador, en 1892 et en 1897, ainsi que sur les îles au large de Terre-Neuve en 1903. Il contribua de cette facon à l'étude de la distribution de nombreuses espèces végétales et animales. Sa collection compte également plusieurs spécimens types qui ont servi à la description de nouveaux taxons de plantes ou de mammifères.

Jewell David Sornborger was the co-author of a paper on Labrador plants; the eponym of three botanical names based on plants from Labrador; and the collector of specimens citations of which are frequently encountered in studies of the flora and botanical history of Labrador. The standard references of botanical history, however, are nearly devoid of information on this biological explorer.

In my attempts to rectify this deficiency, I encountered one short biographical sketch in an ornithological journal, written by Sornborger's friend and neighbour Charles Wendell Townsend, M.D. (1929), a distinguished amateur ornithologist; a number of data and quotations from Townsend's paper appear in this study. Other data presented here are from the records of Harvard University, graciously supplied by Mr. Charles Schille of the Harvard University Archives. My most important source of biographical data, however, was correspondence from Mrs. Eric Streiff and Miss Nancy Sornborger, daughters of Jewell D. Sornborger, to whom I am very grateful for their enthusiastic assistance with this study. Their letters and the records of Harvard University are the sources of basic biographical data throughout the present paper; quotations not otherwise attributed are from their letter of 18 September 1987. Telephone conversations

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Traduction de Céline Arsenault, Jardin botanique de Montreal

with Mrs. Streiff and with her son, Dr. Eric Streiff, dean of Millard Fillmore College of the State University of New York at Buffalo, were also helpful, as were two albums of photographs lent by Miss Sornborger.

Jewell David Sornborger was born 27 November 1869 in San Francisco, California. He was the son of David and Sarah Josephine (Jewell) Sornborger. (The family pronounced the surname with a soft "g.") His parents, however, were not part of the society of that newly incorporated city. Mrs. Sornborger had chosen to spend her confinement at the home of her older sister, Mrs. Timothy Guy Phelps, whose husband had represented the San Francisco district in the U.S. House of Representatives a few years earlier.

The Sornborgers lived in Chenango County, New York, during Jewell D. Sornborger's early years. David Sornborger died not long after the birth of his son, and thereafter the boy and his mother lived in the Jewell family's ancestral home in Guilford (northeast of Binghampton), an impressive residence built shortly after the American Revolution and still in the family as of 1988. In this small-town environment, the young Sornborger and other boys with similar interests "would go looking for birds and birds' nests."

The value placed on education by the Jewells was manifested in the enrollment of Jewell D. Sornborger at Phillips Andover Academy, a prestigious preparatory school in Andover, Massachusetts. After graduation, he entered Harvard University as a special student (i.e., not in a degree program) in the Lawrence Scientific School in 1890. After four years in this status, Sornborger entered a degree program as a member of the class of 1895, but he became ill about this time and was unable to complete the requirements for his baccalaureate.

During his student days, Sornborger learned of an ethnological expedition to Labrador, one of a number of such ventures planned in conjunction with the World's Columbian Exposition to be held in Chicago in 1893. The organizer and leading academic advisor of this expedition, although not a participant, was Frederic Ward Putnam, Peabody Professor of American Archaeology and Ethnology at Harvard, who had been seconded to the World's Columbian Commission as Chief of its Department of Ethnology and Archaeology. Although Putnam was then and remains best known as an ethnologist, he had been curator of ornithology for the Essex Institute in his native Salem, which Institute he served as vice-president until 1894, and he had published several papers on birds. Putnam, therefore, was probably especially pleased by the interest of an ornithologist in accompanying the expedition. Sornborger saw this Labrador expedition as providing an opportunity to conduct biological research and collecting in a region largely unexplored by biologists, and arranged to accompany the expedition as Special Assistant in the Department of Ethnology of the World's Columbian Commission. The expedition sailed from Halifax to the northern tip of the Coast of Labrador during the summer of 1892.

One episode from this voyage, recalled from Sornborger's accounts by his daughters, is that the ship was becalmed and the crew became greatly distressed when their tobacco supplies ran out. Sornborger thereupon "resolved that he would never again be a slave to tobacco."

In 1893 (presumably following the Harvard academic year), Sornborger went to the World's Columbian Exposition in Chicago, to look after the well-being of the Inuit from Rigolet and Eclipse Harbour who had contracted with

the Arctic Exhibit Company to participate in the "Esquimaux village." According to Mrs. Streiff, Sornborger was appointed by an agency of the Crown because of his rapport with the Labrador natives. Further details of the arrangement have not been determined in the present study.[2]

Beginning in 1895 and continuing as long as his health permitted, Sornborger was employed as an ornithologist at Harvard's Museum of Comparative Zoology. As such, although his health had already begun to decline, he was again in Labrador in the summer of 1897. This voyage appears to have been sponsored by Outram Bangs (on whom see B.J.L. Peters, 1933), a wealthy Bostonian who employed a number of men on expeditions to various parts of the world to add to his extensive natural-history collections. By 1897, Bangs had become a leading scholar in mammalogy and ornithology, and two years later he began his official affiliation with the Museum of Comparative Zoology, of which he ultimately became curator of mammals and, at least de facto, of birds as well. Sornborger's primary commission in 1897 was to obtain bones of the extinct great auk, *Pinguinis impennis* (Linnaeus), although he also collected many other plant and animal specimens. Some of the localities visited by Sornborger on these two expeditions, as indicated largely by the data accompanying his botanical specimens, are mapped in Fig. 2.

As well as revisiting several localities along the Labrador Coast in 1897, Sornborger also went to remote Funk Island, 52 km east of Fogo Island, Newfoundland. This had been the site of the largest breeding population of the great auk and of the greatest slaughter of these flightless birds. Few biologists had ever visited Funk Island. It lacked a dock, and attaining the narrow, wave-battered "landing ledge" was difficult and dangerous under the best of conditions. Descending the cliff back down to the ledge and reboarding the boat when encumbered with specimens must have been even more difficult.

The botanical specimens from Sornborger's 1892 and 1897 trips to Labrador were donated to the Gray Herbarium of Harvard University (GH) and came to the attention of Merritt Lyndon Fernald, who had been a fellow student with Sornborger in the Lawrence Scientific School while concurrently working as an assistant in the herbarium. Fernald, who was from Orono, Maine, had already developed a particular interest in the flora of Maine, the Gaspé Peninsula, and what are now the Atlantic Provinces. He and Sornborger prepared a paper (Fernald & Sornborger, 1899) on the noteworthy range extensions and rarities represented among Sornborger's numerous plant specimens, Fernald providing the identifications and comments on taxonomy and phytogeography, and Sornborger contributing the details of dates, localities, and habitats. Initially, Fernald identified all of Sornborger's Labrador plants with previously described species, but later he considered five to represent species new to science, and an additional four to represent new varieties. Another was later considered to represent a new species by Benjamin Lincoln Robinson, also at the Gray Herbarium, and yet another was considered to represent a new form by Frederic King Butters of the University of Minnesota, who had been one of Fernald's graduate students and maintained close ties with the Gray Herbarium.

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2. For an account of the Labrador Inuit in Chicago, see *The Halifax Herald*, Volume XIX, Number 85, April 10, 1893, p. 8. Sornborger's name is not mentioned in this article nor in shorter articles in St. John's, Chicago and New York papers of the same period. However, since it appears that he was enrolled at Harvard when the Inuit arrived in Chicago, it seem likely that his appointment was made later, in response to criticisms of the initial arrangements.

Three of the new specific names and one of the varietal names published by Fernald were typified by specimens collected by Sornborger at Ramah (Table 1). The three "new species" were named *Antennaria sornborgeri, Arnica sornborgeri* and *Draba sornborgeri.*

Table 1. Botanical names based in whole or in part on specimens collected by Jewell D. Sornborger.

name and author(s)	nomenclatural status of Sornborger's specimen(s) at GH	source	current status of taxon
Antennaria sornborgeri Fern., Rhodora 18:237. 1916.	holotype	Ramah	included in *Antennaria alpina* (L.) Gaertn. var. *media* (Greene) Jeps.
Arnica sornborgeri Fern., Rhodora 7:147. 1905.	holotype	Ramah	included in *Arnica angustifolia* Vahl. ssp. *angustifolia*
Artemisia borealis Pall. var. *latisecta* Fern., Rhodora 29:93. 1927.	paratype	Ramah	included in *Artemisia campestris* L. ssp. *borealis* (Pall.) Hall & Clements var. *borealis*
Cochlearia cyclocarpa Blake, Rhodora 16:135. 1914.	paratypes	Baccalieu, Barred and Fogo islands	included in *Cochlearia officinalis* L.
Draba sornborgeri Fern., Rhodora 36:319. 1934.	holotype	Ramah	accepted, as *Draba norvegica* Gunn. var. *sornborgeri* (Fern.) Boivin
Empetrum eamesii Fern. & Wieg., Rhodora 15:215. 1913.	paratype	Baccalieu	classification varies; perhaps best treated as *Empetrum nigrum* L. var. *eamesii* (Fern. & Wieg.) Boivin
Eriophorum spissum Fern., Rhodora 27:208. 1925.	paratype	Tub Harbour	accepted
Habenaria lacera (Michx.) R.Br. var. *terrae-novae* Fern., Rhodora 28:21. 1926.	paratype	Barred Island	accepted, as *Platanthera lacera* (Michx.) G. Don var. *terrae-novae* (Fern.) Luer
Habenaria obtusata (Pursh) Richards. var. *collecteana* Fern., Rhodora 28:175 1926.	paratype	Red Bay	not differentiated at varietal level; species now called *Platanthera obtusata* (Pursh) Lindl.
Oxytropis terrae-novae Fern., Rhodora 30:147. 1928.	paratype	Nain	accepted, as *Oxytropis campestris* (L.) DC. var. *terrae-novae* (Fern.) Barneby
Plantago maritima L. var. *laurentiana* Fern., Rhodora 27:102. 1925.	paratype	Baccalieu	included in *Plantago maritima* L. ssp. *juncoides* (Lam.) Hult. var. *juncoides*

Puccinellia coarctata Fern. & Weatherby, Rhodora 18:13. 1916.	paratype	Barred Island	accepted
Ranunculus allenii B.L. Robins., Rhodora 7:220. 1905.	paratype	Ramah	accepted
Salix rostrata Richards. var. *capreifolia* Fern., Rhodora 16:177. 1914.	paratype	Fogo Island	accepted, as *Salix bebbiana* var. *capreifolia* (Fern.) Fern.
Saxifraga aizoon Jacq. var. *neogaea* Butters forma *frigida* Butters, Rhodora 46:66. 1944.	paratype	Ramah	included in typical *S. paniculata* Mill.
Saxifraga nivalis L. var. *labradorica* Fern., Rhodora 19:142. 1917.	holotype	Ramah	included in *S. nivalis* L. var. *tenuis* Wahlenb.
Trisetum spicatum (L.) Richter var. *pilosiglume* Fern., Rhodora 18:195. 1916.	paratypes	Hopedale and Ramah	accepted at species rank, as *Trisetum triflorum* (Bigel.) A.&D. Love spp. *triflorum*

Since Fernald's time, it has generally been concluded that Fernald recognized too many "species" endemic to Atlantic Canada. In the early years of the present century, many wide-ranging species in the boreal to arctic zones of North America were represented by so few specimens that patterns of variation within the species were not well indicated in herbaria. In more recent times, additional information on variation patterns, as well as on such matters as chromosome numbers and breeding behaviour, has led to some such "endemic species" being subsumed within wide-ranging species. Knowledge that large numbers of pistillate clones of *Antennaria* reproduce agamospermically has resulted in the conclusion that it is inappropriate to treat every such clone as a species. *Antennaria sornborgeri* is therefore, not generally considered to be a "good species" at present, but is instead included in *A. alpina* (L.) Gaertn. var. *media* (Greene) Jeps. Likewise, *Arnica sornborgeri* is now generally included in *A. angustifolia* Vahl ssp. *angustifolia.* The *Draba,* however, is still accepted taxonomically, as *D. norvegica* Gunn. var. *sornborgeri* (Fern.) Boivin, a variety of whitlow-grass endemic to northern Labrador and possibly Baffin Island.

The other five names applied by Fernald to taxa he believed to be new to science, and the one published by Butters, were typified by specimens collected by persons other than Sornborger, from the Island of Newfoundland, Québec or Nova Scotia; Sornborger's specimens from Labrador were listed among the paratypes. Of these names, only *Eriophorum spissum* Fern. is still in use for an accepted taxon, a widespread species of cotton-sedge. The others are listed in Table 1. Sornborger's collection was also cited as a paratype of the name *Ranunculus allenii* B.L. Robinson, still in use for a species of buttercup.

Because of the limited extent of botanical explorations in Labrador and northern Canada at the time, several of Sornborger's other plant specimens represented significant extensions of the known ranges of the respective species. One of the most striking examples was *Potentilla ranunculus* Lange [now sometimes treated as *P. diversifolia* Lehm. var. *ranunculus* (Lange) Boivin], found at

Okak; this taxon had hitherto been known only from Greenland. Another was *Crepis nana* Richards., collected at Ramah. Although now known to occur across arctic Canada, this species was then unknown nearer Labrador than the Coppermine River, over 2700 km to the northwest.

Duplicate botanical specimens from Sornborger's Labrador expeditions, or at least that of 1897, were given by the Gray Herbarium to the herbaria of the botanical museum at Berlin (B; probably none extant) and the Missouri Botanical Garden (MO) (Vegter, 1986).

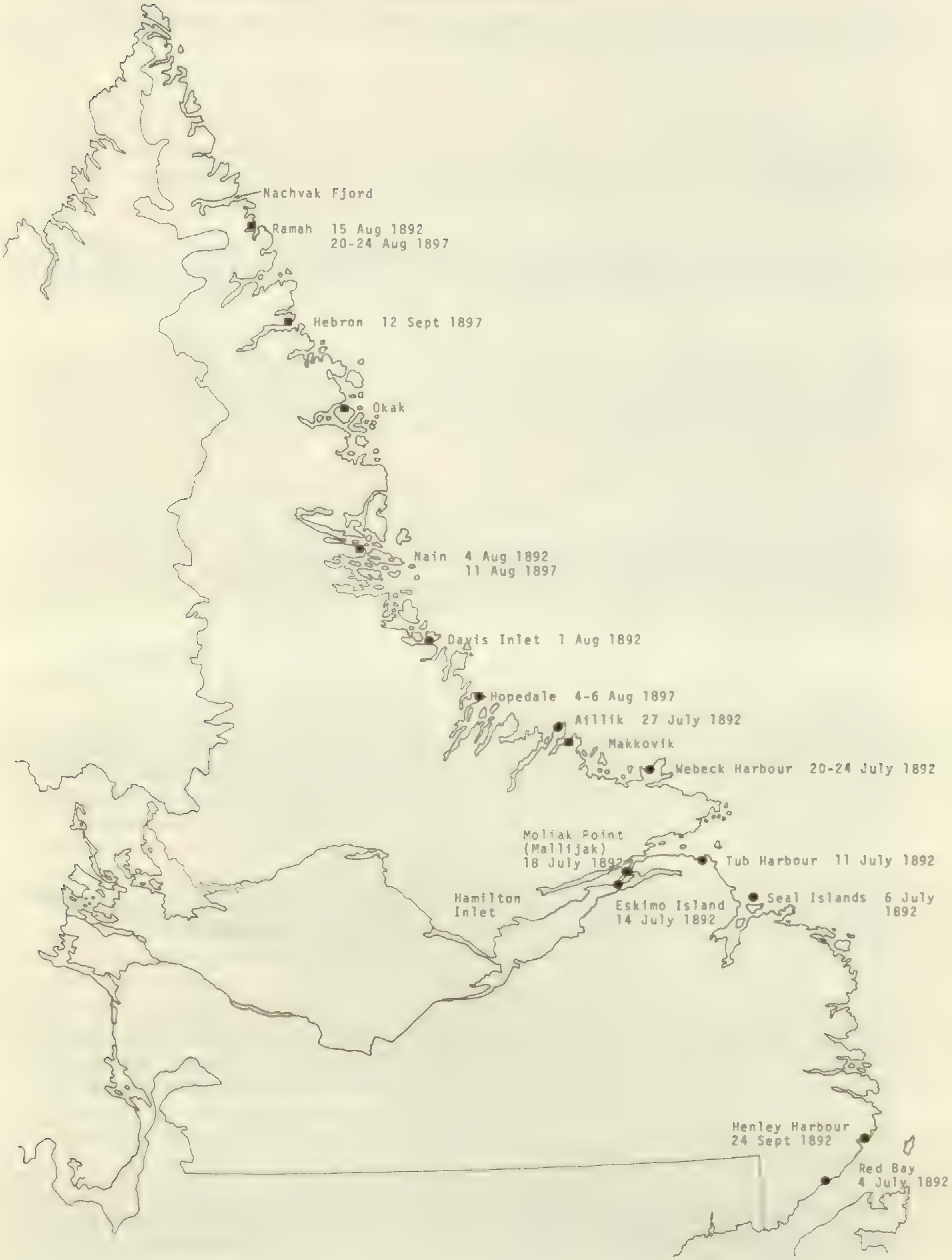
The butterflies that Sornborger collected in 1892 were of considerable interest to Samuel Hubbard Scudder, an eminent entomologist then living in Cambridge after a distinguished career with the Boston Society of Natural History, the Harvard University libraries and the United States Geological Survey. Scudder had already published upon butterflies collected in Labrador by Alpheus Spring Packard. Scudder noted that Sornborger had collected 13 butterflies representing 11 species at 59° N latitude (i.e., at Nachvak Fjord north of Ramah), "beyond the Moravian settlements and therefore further north than any point from which collections ordinarily come." A list of these butterflies was published in the record of the proceedings of the Cambridge Entomological Club (Anonymous, 1895). Scudder also noted that Sornborger had collected one orthopteran (grasshopper) specimen.

Locating citations of Sornborger's vertebrate specimens is more difficult and has only to a limited extent been within the scope of the present study, because no papers were published specifically on his bird or mammal collections. One notable acquisition to which reference was encountered in this study was the first clutch known to science of the eggs of the Labrador subspecies of the gray jay, *Perisoreus canadensis nigricapillus* Ridgway, obtained at Okak in 1892. (The natives believed that a great misfortune would befall anyone who saw, and especially anyone who counted, a clutch of the eggs of this jay.) These eggs were donated to the Smithsonian Institution for study by Charles Emil Bendire, and one was illustrated in a colour plate in Bendire's (1895) *Life Histories of North American Birds.*

In describing a new subspecies of American black duck, *Anas obscura rubripes,* from Labrador, William Brewster (1902), then curator of birds at the Museum of Comparative Zoology, cited a specimen collected by Sornborger in Labrador as being intermediate between the new and the nominate subspecies. Later studies showed that the differences assumed to distinguish these subspecies were actually correlated wtih age and season rather than with breeding range, and no subspecies of American black duck are now recognized, although the species as a whole is now called *Anas rubripes* Brewster.

Sornborger's visit to Funk Island was a major success, in that, as recorded by Townsend (1929), "he collected a large number of the bones of the great Auk, from which he mounted several perfect skeletons," which were "preserved in the Museum of Comparative Zoology at Cambridge and in some other museums."

Sornborger's mammal specimens consisted of skulls, most or all of which were obtained by trading with the Inuit, the greatest number from Okak, some from Hebron and Hopedale. Bangs (1898, 1910), in his annotated lists of the



Jewell D. Sornborger's botanical collecting localities in Labrador.

mammals of Labrador, cited ten species of marine and land mammals of which Sornborger had provided him with skulls. He was especially impressed by "a fine pair" of male and female Atlantic walrus skulls.

Among these specimens were three marten skulls from Okak, which Bangs (1898) interpreted as representing a species new to science, to which he gave the name *Mustela brumalis,* North Labrador marten. The marten of Labrador and Ungava is still recognized as distinct by taxonomists, although now at the rank of subspecies, as *Mustela americana brumalis* (Bangs).

Bangs was also especially interested in the red fox skulls obtained by Sornborger, because these appeared to indicate that the red fox of Labrador was subspecifically distinct from the red fox of more southern latitudes, but he declined to publish a new name without having had the opportunity to study external features. Later, the red fox of northern Maine and most of eastern Canada except southern Ontario was recognized as *Vulpes vulpes rubricosa* Bangs, a subspecies distinct from that prevailing in the eastern United States, but a specimen from Nova Scotia was chosen as the nomenclatural type.

Initially, Bangs (1898) believed, from the two skulls from Labrador obtained by Sornborger, that the black bear of Labrador should be accorded subspecific status, and named it *Ursus americanus sornborgeri.* Later, however, after he had examined more specimens from various parts of the range of this species, he (Bangs, 1910) concluded that the distinction of a Labrador subspecies was unwarranted.

At the Moravian mission sites along the Labrador Coast, Sornborger became acquainted with several of the missionaries, many of whom were interested in natural history and some of whom had raised funds for the missions by selling biological specimens. Those who sent plant specimens to Sornborger (as indicated in Fernald & Sornborger, 1899) included Br. Kristian Schmitt (also known as Christian Smith), whom Sornborger had met at far-northern Ramah in 1892 and at Nain in 1897, and Sr. M.A. (Mrs. Adolph) Hlawatschek, who had been at Hebron on both occasions. Br. Walter Perrett, at Okak in 1892 and at Hopedale in 1897, was an especially congenial acquaintance, sharing Sornborger's interest in ornithology. Perrett had made numerous collections of bird skins and eggs, and had recording many data on bird migration and nesting. He had also collected many insects, especially moths, and some mammals.

Among the specimens that Perrett sent to Sornborger were two of the northern flying squirrel from Makkovik. Sornborger recognized them as a subspecies new to science, which he named and described in his only zoological publication (Sornborger, 1900). The name *Glaucomys sabrinus makkovikensis* (Sornborger) is now applied to the flying squirrels ranging from the Atlantic coast to the eastern part of northern Ontario, south to the Gulf of St. Lawrence and Lake Timiskaming.

Sornborger's greatest friend among the Moravian brethren was Rev. Gottlieb Adolph Stecker (on whom see Anonymous, 1939, and Gapp, 1949), who was at Okak in 1892 and at Ramah in 1897. Sornborger (in Fernald & Sornborger, 1899) made "special acknowledgment" to Stecker for the "many valuable [plant] specimens sent to him," which had been collected "at a season when Labrador [was] inaccessible," and also expressed gratitude for "many other important services." As long as he lived, Sornborger kept in contact with Stecker, even after the latter had moved to Bethel, Alaska, to assume the super-

intendency of the Alaskan missions of his church. Sornborger sent gifts to the Inuit via Stecker, among which were binoculars to aid them in their hunting.

In contrast to the botanical specimens, most of Sornborger's vertebrate specimens from his 1892 and 1897 expeditions were initially deposited in two private collections: his own and that of Edward A. and Outram Bangs. The Bangs' mammal collection was sold to Harvard's Museum of Comparative Zoology in 1899, and their bird collection was donated to the same Museum in 1908. The specimens retained by Sornborger were, upon his death, offered by the family to Harvard. According to Mrs. Streiff, a young man from that university "packed the collection and took [it] to the museum," and "also took two Chinese fighting fish that [her] father had had for several years."

Sornborger again traveled north in the summer of 1903, but it is evident that this trip was not a scientific expedition to the extent that the other two had been. Realizing that his health would not much longer permit such a voyage, Sornborger wanted once more to see the Labrador and Newfoundland coasts, and in particular to behold some of the most interesting and spectacular sights that he had missed on his earlier trips. Letters from the renowned physician Sir Wilfred Grenfell, who had become a friend of Sornborger's, indicated some of his objectives. In one, addressed to someone called Sampson (not further identified, but evidently either a ship's captain or a medical colleague in the Royal National Mission to Deep-Sea Fishermen), Grenfell wrote: "He [Sornborger] may want to take the trip up H[amilton] I[nlet, Labrador] in the *Julia* [*Sheridan*]. If so please take him – you'll find him an authority on Labrador birds, etc." Grenfell's concern about Sornborger's health was expressed in another passage in this letter: "I want you to put him in hospital, if he requires it!! prior to going up the bay or anywhere else." In another letter to an addressee designated Harvey, Grenfell wrote that Sornborger was "very anxious on his way north to visit your factory at Snook's Arm, [Newfoundland] and he also wishes to go out on the Cabot [Strait] and see a whale killed." (Works on Newfoundland in the early twentieth century indicate that a whale-processing plant was located at Snook's Arm at that time. Grenfell's letter may have been to Joseph Harvey, a member of the family that founded Harvey & Co., with many diverse enterprises including fish and whale processing.)

Sornborger's photographs from 1903 all appear to have been taken on the Island of Newfoundland and on nearby smaller islands and waters. How far north he may have travelled on this occasion is not known. The subjects of these pictures include fishing ports with cod-drying racks, a sawmill with lumber awaiting shipment on the docks, and Newfoundland's first hydroelectric power station, built two years earlier at Petty Harbour. Other photographs, taken at sea, appear to indicate that Sornborger did accompany a whaling expedition.

Sornborger's only specimens from 1903 to which references have been encountered in the present study were botanical, all from Baccalieu, Fogo Island and Barred Island. (The last, designated in Sornborger's collection data as being in Notre Dame Bay, was presumably the island by that name near Englee.) These were probably the first botanical specimens from these islands. None of Sornborger's specimens from this expedition was designated the holotype of a new botanical name, but his collections from these islands were listed among the paratypes of six new names published by Fernald and his colleagues at the Gray Herbarium. Four of the taxa so named are still generally accepted (Table 1). Duplicate plant specimens from this expedition, as indicated by

citations in *Ann. Missouri Bot. Gard.* 20:168 (1933), were sent by the Gray Herbarium to the herbaria of the New York Botanical Garden (NY) and the Smithsonian Institution (US).

The visit to Baccalieu was evidently the highlight of Sornborger's travels in 1903. It is especially unfortunate that he did not publish upon his observations on this island, because he was evidently the first biologist to see and photograph this island's nesting colony of northern gannets and black-legged kittiwakes.[3] There are only three known nesting sites, historic and present, of the northern gannet, *Sula bassana* (Linnaeus), on Newfoundland and the islands off its coast. The colony on Baccalieu, although it had long been known to a few local residents, remained unknown to ornithologists other than Sornborger, and unmentioned in the literature on gannets, until its rediscovery by Harold Seymour Peters in 1941. There has been considerable speculation about the age of this gannet colony. Although gannets have probably nested at least intermittently on Baccalieu for centuries, there is some evidence that they were absent from the island between ca. 1875 and ca. 1900 (H.S. Peters, 1942; Templeman, 1945). Sornborger's photographs document the presence of a gannet colony on Baccalieu as early as 1903.

Sornborger's illness, characterized by his friend Townsend (1929), a physician, as "a disease of the heart and arteries" that subjected him to increasingly frequent "attacks, which invalided him for long periods," dictated his retirement from the Museum about 1901. He moved for a short time to Ipswich (where Townsend also lived) and then to Rowley, which borders Ipswich on the north. As long as he was able, he "went on many long walks around the countryside" with "friends that were interested in wild flowers, birds, [and] butterflies," Townsend doubtless being among them. He also hybridized irises and peonies. His horticultural breeding, however, appears to have been a strictly private activity, as the publications of the American Iris and Peony societies list no cultivars introduced by him nor indicate any other involvement with these organizations. He was, however, a member of the Massachusetts Horticultural Society. As he became more and more confined to his home, he devoted his attention increasingly to philately, specializing in first-flight covers from the new air-mail routes that were being established in the 1920s.

Jewell D. Sornborger died at his home in Rowley 24 February 1929. He was survived by his wife, née Helen Robertson, and three daughters, Helen Robertson Sornborger, Elizabeth Jewell Sornborger (later Mrs. Eric Streiff, Sr.) and Nancy Whiting Sornborger. Townsend (1929) characterized him as "a careful and accurate observer and of a quiet and retiring disposition," who "was an interesting talker on his chosen subjects, in which he kept up his interest to the last"; and as "patient and uncomplaining" in his long illnesses.

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3. The island depicted in a series of photographs by Jewell D. Sornborger was identified as Baccalieu by Ms. Marilyn Dawe of the Newfoundland Museum. I am grateful to her and to Dr. Peter J. Scott of the Department of Biology, Memorial University of Newfoundland, for this information. One of Sornborger's photographs in this series shows a gannet with the Baccalieu lighthouse in the background.

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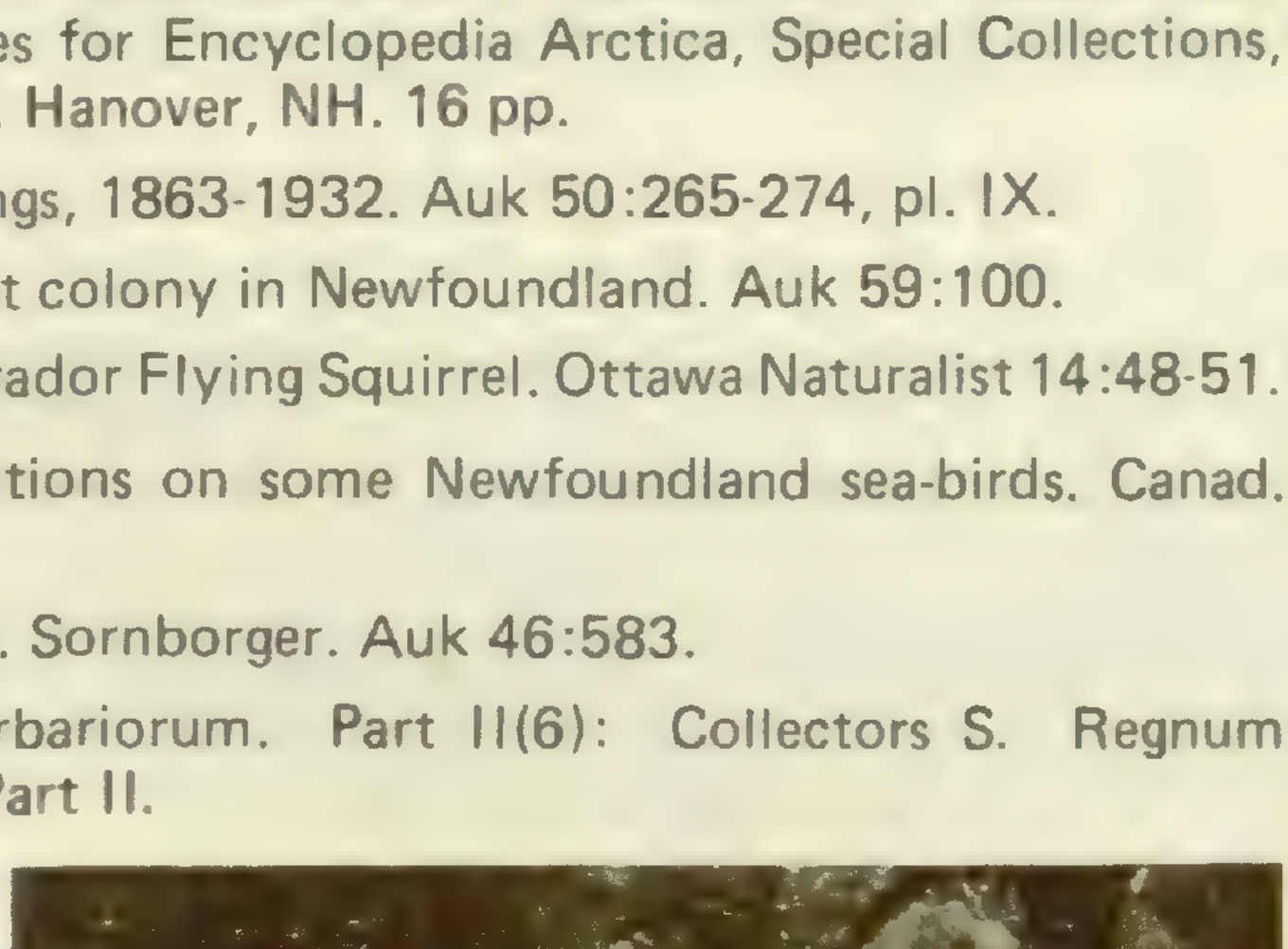

Northern gannets on the nest on Baccalieu, 1903. From a photograph by J.D. Sornborger.

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